

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method for determination of the lubricating oil consumption of an internal combustion engine-(2), in which:

the lubricating oil whose consumption is to be measured is labeled with a determined quantity of at least one radioactive tracer;

downstream of the engine-(2), the quantity of radioactive tracer(s) present in the gases emerging from the ~~latter engine~~ is measured; and

the lubricating oil consumption of the engine is deduced therefrom;

~~this said method being one characterized in that wherein~~ the measurement of the quantity of radioactive lubricating oil tracer(s) present in the gases emerging from the engine comprises:

bringing ~~these said~~ gases in contact with a trap (7)-which can physically retain the radioactive tracer particles;

with the aid of a detector (11)-sensitive to radiation emitted by the radioactive tracer(s) retained by the trap (7)-and placed at a distance therefrom allowing the emitted radiation to be measured, continuously, and while the engine is in use, measuring ~~this said~~ radiation coming from the trap; and

transmitting the measurements taken by ~~this said~~ detector (10)-to a programmed computer which can convert ~~these said~~ measurements into the lubricating oil consumption rate of the engine.

2. (currently amended): The method as claimed in claim 1, ~~characterized in that wherein~~ the trap includes at least one filtration element formed by at least one filtering medium with a porous structure, fixed in metal canning.

3. (currently amended): The method as claimed in claim 1 or 2, ~~characterized in that wherein~~ the radioactive tracer incorporated into the lubricating oil is a radioactive element with a short half-life, ~~in particular bromine-82 or technetium-99m.~~

4. (currently amended): The method as claimed in claim 3, ~~characterized in that wherein~~ the radioactive tracer incorporated into the lubricating oil is technetium 99m, and said technetium 99m is incorporated into the oil in the form of an aqueous solution of sodium pertechnetate NaTcO_4 .

5. (currently amended): The method as claimed in ~~claim 1~~ claim 3, ~~characterized in that wherein~~ the radioactive tracer incorporated into the lubricating oil is technetium 99m, and said technetium 99m is incorporated into the oil in the form of particles which have nanometric dimensions and are isolated from the atmosphere by carbon.

6. (currently amended): The method as claimed in claim 1, ~~characterized in that wherein~~ the radioactive tracer incorporated into the lubricating oil ~~is~~ comprises at least one element selected from the group consisting of germanium-68 and/or germanium-69, preferably in the form of at least one tetraalkyl germane containing at least germanium-68 and/or germanium-69.

7. (currently amended): The method as claimed in claim 1, ~~characterized in that wherein~~ the radioactive tracer ~~is~~ comprises an element, or a compound comprising ~~this said~~ element, which has been at least one of neutron activated and/or activated by a proton beam before incorporation into ~~this said~~ oil.

8. (currently amended): A device for the continuous determination of the lubricating oil consumption of an internal combustion engine ~~(2)~~, this said device comprising:

[[a]]means for incorporating a determined quantity of at least one radioactive tracer into the lubricating oil;

means for measuring downstream of the engine, in the combustion gases emerging from the ~~latter~~engine, the quantity of the radioactive tracer which is present therein; and

means for deducing the lubricating oil consumption of the engine from ~~this said~~ measurement;

~~this said~~ device being one which comprises:

(i) downstream of the engine ~~(2)~~, a trap ~~(7)~~ with which the combustion gases emerging from the engine come in contact and which can physically retain the radioactive tracer particles present in ~~these said~~ gases;

(ii) in proximity to ~~this said~~ trap ~~(7)~~ and at a distance therefrom allowing radiation emitted by the radioactive tracer particles retained by ~~this said~~ trap to be measured continuously and while the engine is in use, a detector ~~(10)~~ sensitive to ~~this said~~ radiation;

(iii) functionally linked to the detector ~~(10)~~, a programmed computer ~~(11)~~ which can calculate the lubricating oil or additive consumption of the engine on the basis of the information recorded by the detector.

9. (currently amended): The device as claimed in claim 8, ~~characterized in that wherein~~ the trap ~~(7)~~ includes at least one filtration element formed by at least one filtering medium with a porous structure, fixed in metal canning.

10. (currently amended): The device as claimed in claim 8 ~~and or~~ 9, ~~characterized in that wherein~~ the trap ~~(7)~~ is placed on the combustion gas exhaust line of the engine ~~(2)~~, or on a branch line intended for ~~this purpose~~ exhausting combustion gas from the engine.

11. (currently amended): The device as claimed in ~~any one of claims 8 to 10~~ claim 8, ~~characterized in that wherein~~ the trap ~~(7)~~ comprises a particle filter.

12. (currently amended): The device as claimed in ~~any one of claims 8 to 11~~ claim 8, ~~characterized in that wherein~~ the detector ~~(10)~~ is a probe for detection of ionizing radiation.

13. (currently amended): The device as claimed in ~~any one of claims 8 to 12~~claim 8, ~~which comprises~~ further comprising a filter (9) arranged on the combustion gas exhaust line, between the trap (7) and the point where ~~these~~ said gases are discharged to the atmosphere.

14. (new): The method as claimed in claim 3, wherein the radioactive tracer incorporated into the lubricating oil comprises bromine 82 or technetium 99m.

15. (new): The method as claimed in claim 6, wherein the radioactive tracer incorporated into the lubricating oil comprises at least one tetraalkyl germane containing at least one of germanium-68 and germanium-69.